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MAN, MEDIA, AND MACHINES--THE TEACHER AND HIS STAFF.

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AN ORGANIZATIONAL MODEL FOR THE SCHOOL IS PROPOSED, PLACING TEACHERS AT THE CENTER OF THE DECISION-MAKING PROCESS AND PROVIDING THEM WITH A SUPPORTIVE STAFF TO HELP INDIVIDUALIZE EDUCATION. IN THIS MODEL, A DIRECT INSTRUCTION TEAM WORKS WITH A PROFESSIONAL STAFF, WHO ORGANIZE INSTRUCTIONAL MATERIALS AND PROVIDE CONSULTANT HELP, AT THE INSTRUCTIONAL SUPPORT CENTERS. COPIES OF THIS DOCUMENT MAY BE OBTAINED FOR $0.75 EACH FROM THE NATIONAL EDUCATION ASSOCIATION, PUBLICATIONS-SALES SECTION, 1201 16TH STREET, N.W., WASHINGTON, D.C. (MS)

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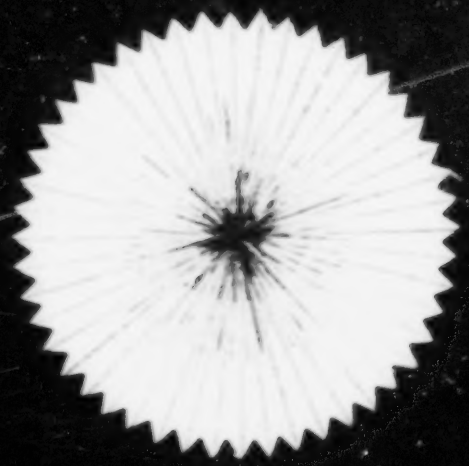

Man, Media, and Machines

by
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The Teacher and His Staff

Man, Media, and Machines

National Commission on Teacher Education and Professional Standards
and Center for the Study of Instruction
National Education Association of the United States
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Contents

Foreword ——— 5

Introduction ——— 7

The Direct-Instruction Team and Support Centers ——— 10

A Day with a Teacher ——— 16

The Team and the Teacher ——— 20

Kinds of Learning ——— 21

Postscript ——— 24

Selected References ——— 25

Foreword

The school of the future, if one listens to a vast number of predictions, will be quite different from the school of today. In this publication, Bruce R. Joyce adds an articulate voice to the discourse. The Joyce school of tomorrow describes new and different roles for the competent and imaginative teacher and interesting though unusual ways to orchestrate his resources.

The Center for the Study of Instruction (CSI) and the National Commission on Teacher Education and Professional Standards (NCTEPS), both units of the National Education Association, are pleased to present *The Teacher and His Staff: Man, Media, and Machines* to what we hope will be a large audience. Our purpose is to add to the dialogue about school organization by suggesting some ways that teachers and technology can be brought together to create personalized educational programs. "For too many years," says the author, "uniformity of structure has characterized the American school." Teachers have had too few alternatives from which to select. Now there are more choices.

What might appear to be a defect in this document is, in our opinion, meritorious. Dr. Joyce does not bore the reader with long lists of principles of child growth and development or the learning process, or with repetitious advice about loving children. He respects the reader by assuming that he has this basic knowledge. For example, it is assumed that we understand the following principles are fundamental to our consideration of the exciting ideas in this book:

1. Each individual is a person worthy in his own right.
2. A human self becomes a self through the process of interacting and interrelating rather than through unfolding.
3. Each child is unique.
4. The individual learner must be seen as a total organism — active, ongoing, growing.
5. Creativity and uniqueness, based upon a common heritage rather than blind conformity and stereotype, are the values appropriate for enhancing process.

A less than careful reading might lead one to believe that Harvey Thompson, the team leader, will become an unguided missile and possibly have a nervous breakdown. We do not believe that this will follow. Dr. Joyce's philosophy about the relationships of man, media, and machines to the teacher's work is obviously one man's opinion — but a very interesting one.

No one at CSI or at NCTEPS anticipates or particularly desires complete agreement with all the ideas in our various publications. If some of them are at odds with beliefs firmly held by other equally conscientious educators, what must be resolved is not the integrity of the individuals who agree or disagree but the validity of the beliefs themselves.

Dr. Joyce is an authoritative voice on curriculum and school organization who presents his views with thought and zest. He is an exciting man, a most valuable stimulator for the teachers he serves.

There are, of course, no easy, final answers to important problems of teaching. This document will make a difference in the lives of America's teachers only if it is used as a guide for self-study, as a stimulus for discussion not as if all the ideas should be adopted without careful thought.

This publication comes during and as part of The Year of the Non-Conference, which is designed to help improve American education by making the job of the teacher more manageable and productive. CSI and NCTEPS have a common commitment to this objective. The joint sponsorship of this publication is significant evidence of continuing fruitful collaboration between the two units.

We express our appreciation to the author and to staff members who made important contributions to the planning and production: Robert McClure, associate director, CSI; Roy A. Edelfelt, associate secretary, NCTEPS; Geraldine E. Pershing, senior editor, NCTEPS.

Don Davies
Executive Secretary, NCTEPS

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Director, CSI

Introduction

How can we provide an education that is at once highly personal, highly intellectual, and extremely relevant to life in today's world? The student needs an education personal enough to enable him to develop on his own terms, to inquire into things that excite him as an individual, to develop his aptitudes, and to strengthen his weaknesses. He needs an intellectual education that makes available to him the power of the structures and modes of inquiry of the scholarly disciplines and helps him to develop effective strategies for analyzing and solving problems. He needs a social education that commits him to the welfare of mankind, helps him reflect on the moral situation of man, and induces him to consider alternatives in his own life and in the future of the world. He needs to learn how to live in his society and how to enhance it without becoming enslaved by its status quo.

A truly vigorous personal, intellectual, and social education can be created only if the teacher and the student, as they work together, have many options available to them — options which enable students to engage in a large variety of instructional activities and which assist teachers to perform a corresponding diversity of instructional roles. They need a rich laboratory of books, audiovisual media, and other technological resources so that they can create at least three basic types of learning situations that serve as distinct but overlapping needs of the student.

- To develop on his own terms, follow his special interests, enlarge his particular talents, and nurture his uniqueness, the student needs the teacher to function as his "academic counselor," his personal guide, facilitator, alter ego, and friend.
- To develop basic knowledge and skills, such as learning to use language and number symbols, and to acquire a general knowledge of the world and an introduction to the academic disciplines, the student requires individualized instruction. His program should be geared as much as possible to his rate of achievement, his learning style, and his strengths and weaknesses. His teacher serves him as a diagnostician and prescriber.
- To become an effective member of an inquiring group that tracks down information, checks out hypotheses, debates social issues, "practices" the scholarly disciplines, and tries out old ideas and creates new ones requires that a student have teachers who lead an inquiring group and help it become a self-propelling miniature democracy whose members

improve their interpersonal development in the course of their academic inquiry.

The means for creating such an education are coming within our grasp. Advancing technology and new understanding are about to make it possible to prescribe for each child the learning materials and teaching strategies which closely match his achievements, ability, and learning style.[1] We are beginning to have learning materials prepared by advanced scholars. We have it within our capacity to develop continuous materials development systems which through motion pictures and television tapes and written materials will allow each child to have contact with the thinking of advanced scholars and those who reflect on the course of our society.[2] New knowledge is emerging about the dynamics of the social system of the school, about ways of creating a social climate that fosters reflective thinking and supports the individual as he seeks for meaning.[3] Special techniques are being developed to help teachers improve their capacity to work with children supportively and to evolve new teaching strategies.

Across the nation experiments are under way in new patterns of school organization and staff deployment.[4] New concepts in school architecture are being tried out in many settings — concepts that open the way to development of more nearly flexible educational patterns.[5] Educators have learned to use the computer to augment flexible scheduling to enable greater personalization

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[1] Especially advances in computer-assisted instruction and self-instructional programmed materials. See the work, especially, of the Research and Development Center of the University of Pittsburgh, the projects of the Systems Development Corporation, Santa Monica, and the mathematics program directed by Professor Patrick Suppes of Stanford University.

[2] The academic curriculum reform movement is referred to here, of course. For an overview see: Goodlad, John I., and others. *The Changing School Curriculum*. New York: Fund for the Advancement of Education, 1966; or Heath, Robert W., editor. *The New Curricula*. New York: Holt, Rinehart and Winston, 1964. The experiments in use of media at Nova School in Fort Lauderdale, Florida, are also relevant.

[3] The Valley Winds school in St. Louis has been the scene of an exciting experiment in the development of such a social climate. The University of Chicago Laboratory School has also been a leader in this area, both by innovating and by serving as a site for relevant research. James S. Coleman's *The Adolescent Society* (Free Press, 1962) and the research of Pace and Stern have helped us understand better what is going on in the social system of the school. Much theoretical work on mental health is also relevant here, such as: Cumming, John, and Cumming, Elaine. *Ego and Milieu*. New York: Atherton, 1962; and Rogers, Carl. *On Becoming a Person*. Boston: Houghton Mifflin, 1961 (especially Part VI).

[4] For acquaintance with this work see: Yale-Fairfield Studies of the 1950's; *Bulletin of the National Association of Secondary-School Principals*, January 1962; and Anderson, Robert. *Teaching in a World of Change*. New York: Harcourt, Brace and World, 1966.

[5] The publications of Educational Facilities Laboratory, 477 Madison Avenue, New York, N. Y. 10022, provide a handy overview. See especially, *Profiles of Significant Schools*.

of education and more effective use of resources.[6] The concept of the library has developed into that of a learning laboratory which includes media of many kinds *and* teachers who help individuals and groups of students with their inquiry.[7]

Inroads *are* being made into the complex of problems that must be solved in order to develop a fully personal, intellectual, and humanistic education. Schools everywhere must search for methods of organization so that exciting teachers can orchestrate the many resources available to them and to the children they teach.

This publication proposes an organizational model or structure for the school — a structure that places human teachers at the center of the decision-making process [8] and provides them with the supportive staff to help work with children, individualize instruction, and personalize education. The structure also makes available to the teacher many persons who can bring scholarship, special human relations training, and technological know-how to the learning situation.

The model structure that follows is not presented as a prototype for organizing schools. Rather, it should be regarded as a hypothetical attempt to think through the job of constructing an educational system in which many teachers and resources work together for the benefit of the individual student.

Advocates of educational technology sometimes talk as if they plan to create machines that would take on all teaching functions. Some teachers react to technological developments as if they were bound to be dehumanizing. It is wiser to think of the possibilities as well as the limitations of machines, books, and humans and to search for ways of taking advantage of all of them. Let us see.

It may be possible to develop organizational structures that provide teachers with supporting staffs and supporting technological systems, both of which would increase the options with which the teacher can work — and which perforce are available to the student. In order to look at the practical aspects of developing such an organizational structure, let us travel to a mythical school in the near future where a teacher named Harvey Thompson operates with a direct-instruction team and support teams. Although the setting is an elementary school, many of Harvey's tasks are identical with those of secondary school teachers.

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[6] For example see: Bush, Robert, and Allen, Dwight. *A New Design for Secondary Education*. New York: McGraw-Hill Book Co., 1964.

[7] Again, an Educational Facilities Laboratory publication, *The School Library*, is useful.

[8] The essay does not deal with the decisions made by others in the establishment — school boards, central office staffs, principals, etc. Their decisions form the context in which crucial instructional plans are made and carried out. As will be seen, some shifts of decision-making responsibility from one group to another are proposed by implication in this paper.

First, we will look at Harvey Thompson's team and some of the technological support centers that are available to him. Then we will trace a mythical day in Harvey Thompson's professional life so that we can examine the practical aspects of his work with his support teams. The day, of course, will not be typical; it will be constructed to permit us to examine instructional roles and possibilities that normally would occur only in a period of weeks.

Let us begin by looking at his staff.

The Direct-Instruction Team and Support Centers

Harvey Thompson is the leader of an elementary school direct-instruction team of eight members. Marge Wilson is the assistant team leader. Harvey and Marge are jointly responsible for the direction of the team and the continuing education of its members. He is a science specialist; she is a reading specialist.

Harvey and Marge are responsible for creating and carrying out the operating curricula for two hundred children. They orchestrate the resources of the school so that curricula are tailored to the special characteristics of the children, the school, the community, and the subject matter requirements. They have guides which outline skill and subject matter developmental plans created by an area curriculum council.[9] This council is composed of subject specialists and representatives from each direct-instruction team.

Two other members of Harvey's team have professional status. George Bryant is a young teacher in the social sciences. He hopes to become a specialist in computer-assisted instruction (CAI), and Harvey and Marge arrange for him to work as much as possible with the computer support center. Florence Smith is a middle-aged woman who returned to teaching after an absence of several years. She expects to become a reading specialist, and therefore, much of her in-service education is Marge's responsibility.

The team also includes four paraprofessionals. Joan Schultz and Maureen d'Andrea are college graduates, in social science and mathematics respectively. They both completed a special course to prepare them to work with a team and will continue their professional preparation for teaching. Their one-year

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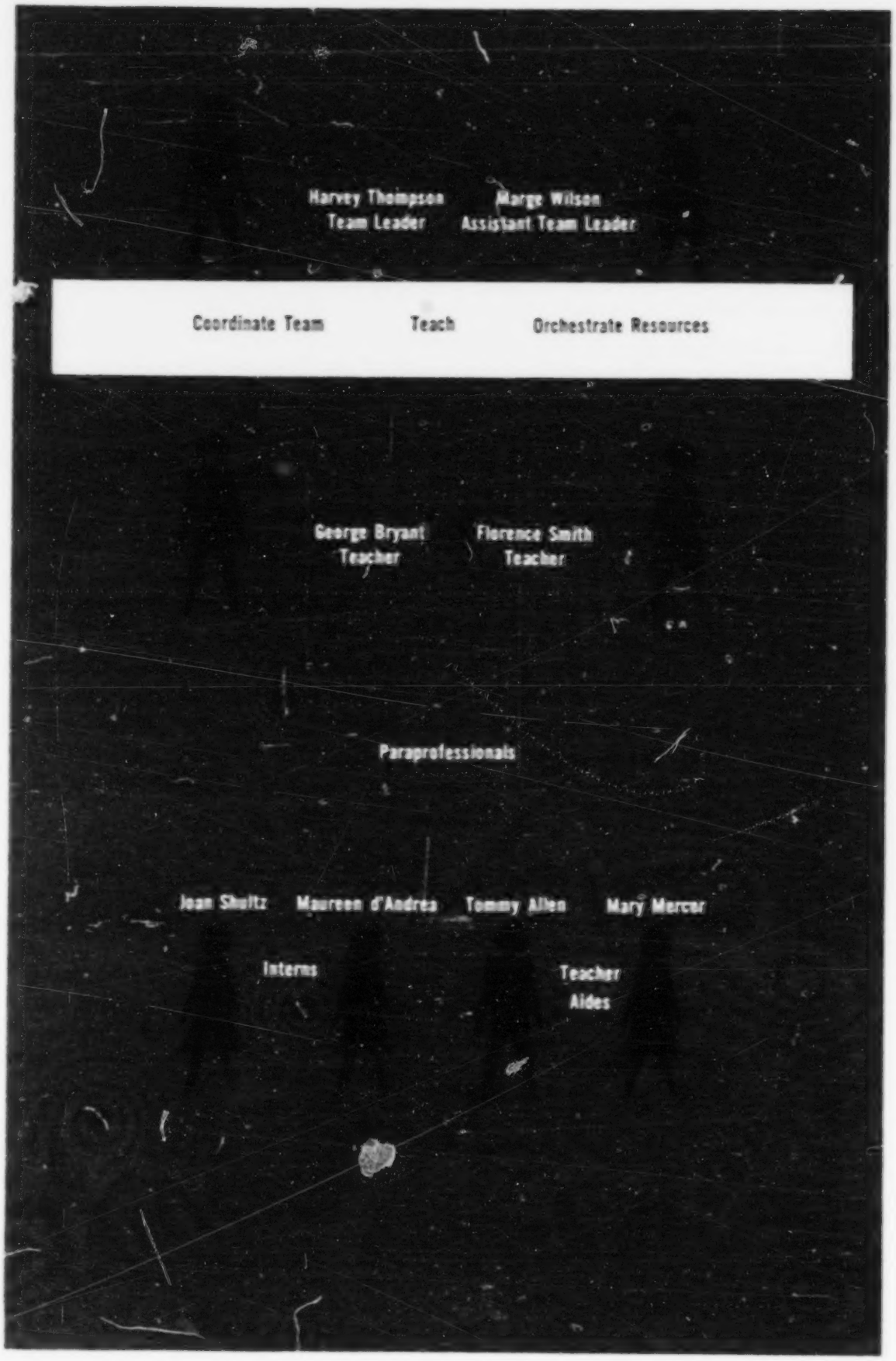
[9] An area is an operating unit of schools. Very large school districts are broken down into several operating areas, whereas small school systems cooperate to create areas large enough in student population to afford sufficient supporting facilities to teachers.

Direct-Instruction Team



assignment to the team is part of that preparation. Next year they will be rotated among the instructional support centers for further preparation.

Tommy Allen is a nineteen-year-old high school graduate as yet unclear about his future. He and many other youngsters like him are attached to direct-instruction teams and instructional support centers throughout the school district where they work under supervision and where guidance is available to them. At the end of each year Tommy and his peers discuss their future roles and educational plans with the personnel director. As long as they remain attached to instruction teams, they must further their education.

Mary Mercer is also a high school graduate. She is married and the mother of two children and is a warm, supportive person who tends to gather around her the shy and lonely youngsters. One of her responsibilities is the orientation of new children under the guidance of the direct-instruction team.

Harvey and Marge deploy team members to cover the responsibilities required by their instructional plans. While certain kinds of teaching are done only by the professional team members or by professional teachers in the instructional support centers, all the team members, including the paraprofessionals, function in teaching roles. The paraprofessionals usually take care of moving the children from place to place, set up equipment, and help maintain an attractive and efficient environment. As they gain experience and competence, however, they are able to carry on much significant teaching.

Harvey Thompson's staff, besides the team members, also includes the professionals and paraprofessionals in six instructional support centers — his extended staff. These are specialists who create or organize instructional materials and programs for direct-instruction teams and provide consultant help. Let us look briefly at the instructional support centers.

Computer Support Center

The staff includes two teachers who are specialists in computer-assisted instruction, several paraprofessionals, including computer programmers, and personnel who are temporarily assigned to the center for various purposes. These people are specialists in the application of computer technology to problems of curriculum and instruction. They develop computer simulations, automate canned programmed instruction materials, adapt them for use in the local schools, and work with other support centers to automate other procedures. They automate the scoring of objective tests and help the direct-instruction teams use the computer to track student progress. One computer support center serves about twenty direct-instruction teams. For many applications, it uses a large computer which in turn is used by many computer support centers throughout the region.

Self-Instruction Center

This center serves five or six direct-instruction teams. It contains many programmed materials and many packets of self-instruction materials — some purchased from commercial firms, others made up by the staff in consultation with subject specialists and direct-instruction team members. For example, it has self-instruction programs in mathematics and science which were purchased from commercial firms, and homemade social studies materials developed jointly by the staff, the computer support centers, and the social science specialists of the district. It has constructed packets of readings on world history that are used by the social science team in the high school and similar materials for secondary school science and mathematics. Direct-instruction teams — served by the self-instruction center — may use its library of materials or request the development of special materials. Children sometimes go to the self-instruction center where there are carrels and a staff to help monitor pupil progress. At other times materials are taken from the center to the suite of the direct-instruction team and their students.

It is important that a self-instruction center have the capacity not only to adapt commercial materials but also to develop materials on its own. In that way it can serve the particular needs of direct-instruction teams and the children for which they are responsible.

Inquiry Center

The inquiry center is a library in the most advanced sense of the word. Its collection of materials includes slides, records, tape recordings, and facilities for listening and viewing.[10] The staff of professionals and paraprofessionals help the children use the equipment and carry out their personal inquiry. The staff includes subject specialists who are responsible for determining that the materials are adequate in each subject, consulting with members of the direct-instruction teams in developing resource and instructional units, preparing with team members teaching units in which they participate, giving lectures and demonstrations to large groups, and working with team leaders on in-service training programs.

Materials Creation Center

The materials creation center is staffed by professional writers, artists, and audiovisual specialists. They work with both the direct-instruction teams

[10] For a complete description of the development of an instructional resource center with comparable capability, see the Educational Facilities Laboratory publication, *The School Library*.

and the staffs of the self-instruction and inquiry centers. For example, a direct-instruction team and a social studies expert may want materials created for a special instructional unit on one of the new nations of the world. They would consult with the staff of the materials creation center to have new materials prepared that would be appropriate for the children. Or, a team might want materials especially for culturally disadvantaged children. The center can respond when no suitable commercial materials are available, and it might develop projects on its own.

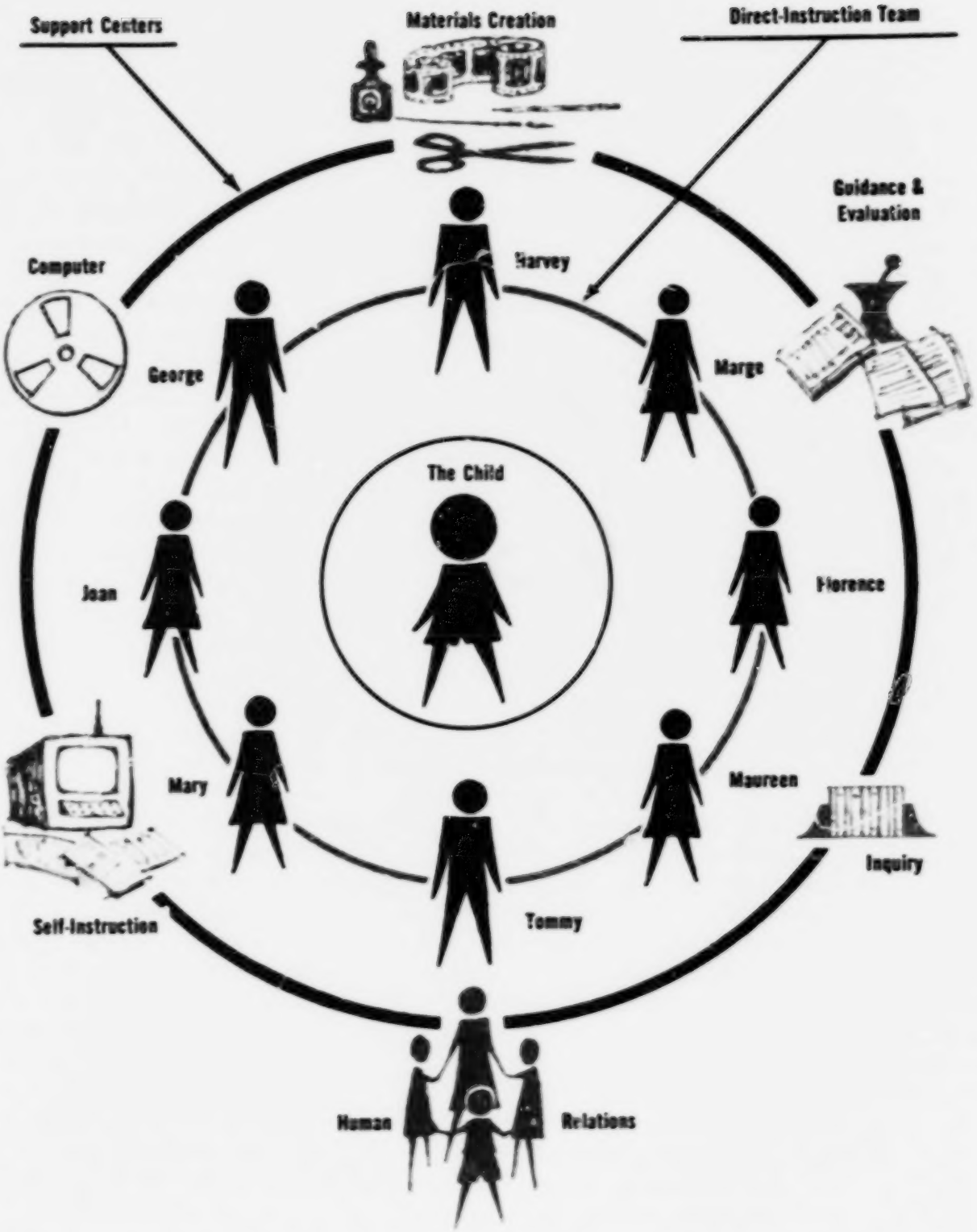
The materials creation center frees the schools from over-dependence on commercial firms. It enables the development of books and other materials about topics which do not attract commercial publishers.

Human Relations Center

The human relations center staff helps the direct-instruction team with diagnosing and correcting problems within the social climate. A human relations center expert might work with a small group of children for a period of time, helping them to organize themselves more efficiently and to work together more effectively. Children might be sent to the center for a period of time to work in a special program designed to increase their interpersonal capacity and flexibility. The human relations center, however, is not a "life adjustment factory," devoted to subordinating individuals to the interests of the group. On the contrary, it exists to help in human relations situations which occur among staff and children so that both group and individual learning needs are satisfied. In large city school districts, such organization might work in inner-city schools for long periods of time, helping to improve the climate of the schools and to work out better social systems within those schools.

Guidance and Evaluation Center

This center works with both the computer support staff and the human relations staff to help the direct-instruction team diagnose and make prescriptions for individual progress. It creates special tests and special assessment devices. The counselors work with children to identify intellectual capacity and growth and to make prescriptions so that each child can grow according to his own capacity. The guidance and evaluation staff does the test-making for most direct-instruction teams, although some teams prefer to do their own and rely on the center for advice and technical assistance.



The Direct-Instruction Team and Support Centers

A Day with a Teacher
October 22, Some Year in the Future

8:00 a.m.: Harvey Thompson convenes a meeting of his direct-instruction staff to discuss two aspects of the educational program.

The first agenda item is a new project that involves the computer support center. Technicians at the center have developed a model store, and Thompson's team and the computer center staff are working out ways students can use simulation to learn the economic principles that operate as a store purchases goods, sets prices, creates advertising programs, and organizes its personnel. The students are to learn the economic principles by making decisions in the game-type situation. As they make decisions about the price of a product, they will receive feedback on sales and will be able to adjust prices, advertising, and other factors to see if they can increase the sales of the product.[11] The program has been used successfully with older children, but this is the first attempt to apply it to the seven-to-nine age bracket. A staff member of the evaluation center will observe the process and advise about the testing program. The social science specialist from the independent inquiry center also will be an observer and consultant; if the experiment works, the material may have use there.

Thompson and his staff select twenty children to take part in the initial project. If all goes well, the number of students who participate will be increased. Although his team has much help from computer personnel, Thompson wants to proceed slowly so that the team can train themselves both to use the simulation effectively and to follow up with instruction that does not take place in the center. He also wants to give George Bryant, who has a social science background, a chance to explore whether he wants to continue to prepare to be a specialist in computer application.

The second project discussed in the team meeting is the fine arts program. With the help of the local art museum and specialists from the creative arts and humanities departments of the high school, the staff has developed a unit on Renaissance art. Some of the staff have difficulty discussing Renaissance art with the children, and some of the children are not interested. They arrange for one of the museum specialists, who has had success with children, to hold a demonstration later that day so that the staff can observe how he handles the content. Some of them are dubious about the value of the unit in general, and Mary Mercer, one of the subprofessionals, is assigned to discuss with the children their reactions to the program and report back to the team.

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[11] Readers will recognize that this is no mythical game but one of the several computer-based economics games presently being experimented with by Dr. Richard Wing and his associates at the Board of Cooperative Educational Services for Northern Westchester County, Yorktown Heights, New York.

The meeting ends at 8:40 a.m. and Harvey Thompson prepares to lead a science discussion at nine o'clock. Marge Wilson, Maureen d'Andrea, Tommy Allen, and Joan Schultz take the time until then to discuss some problems in the reading program.

9:00 a.m.: Harvey Thompson leads a discussion, by ten children, of a science project on static electricity. Tommy Allen observes because he will be following up on what Harvey does during the rest of the week. Thompson handles two project groups regularly — this advanced one and a group of difficult children he hopes to reach through their interest in science.

Mary and Maureen have gone with a group of children to the inquiry center to select books for independent reading. Joan and Florence have gone with another group to the self-instruction center to work on reading skills. The program was set up by Marge Wilson in consultation with the support center, and it is Joan and Florence's job to administer the program and give the children personal help. At the same time, Marge is working with a group of slow readers who have not been responding to self-instruction materials. She has developed an approach which tailors activities to their specific needs. George Bryant is watching the CAI technicians prepare the simulated store.

Before the hour is over, Tommy leaves the science discussion to set up a large group instruction room for a current events film showing. Several intermediate grade teams believed that many children of the age group 7-9 did not learn much from commercial television newscasts and that films prepared weekly by local news agencies were also not well-adapted to that group. Consequently, the materials creation center specialists film a short newscast each week which is circulated among the direct-instruction teams.

10:00 a.m.: Harvey and George are in the computer support center watching their students operate the simulated store. The experience is so positive that the decision is made to continue with that group of children on a regular basis and to begin the simulation with another group. Harvey arranges to brief the computer staff fully on the social studies program — the matrix of the game simulation. Harvey and George begin to discuss ways of establishing relationships between the store game and the rest of the program. It is George's task to see that there is follow-up when the children get back under the wing of the direct-instruction team.

Harvey also arranges for two members of the computer support staff to bring the simulated store directly into the team suite after the trial period is over. He feels that the trial should be held in the center area, where he and the computer support staff can review and revise the materials. But when it becomes a regular part of the social studies program, the simulation should be moved to the team suite.

While there, Harvey discusses with the computer center director some new individualized developmental spelling programs brought to his attention

by the self-instruction center. His students have been doing well with such programs, which are restricted to [illegible]s and perhaps one other team because evaluation of student progress is so laborious. The director of the self-instruction center has concrete evidence that if computer assistance is added, such programs can be used with teams throughout the school district.

10:50 a.m.: Harvey watches the end of the discussions of the current events film, conducted by Florence, Marge, Joan, and Maureen. Joan has tape-recorded her session so that Harvey or Marge can help her analyze and improve her teaching. It is weekly routine for each member to record or video-tape a lesson and review it with another team member. The team also routinely makes video-tape recordings of large group presentations for possible later use. Often the team likes to prerecord lectures or demonstrations on video tape for more flexible use with smaller groups of students.

11:00 a.m.: Harvey spends the next hour preparing a set of creative writing activities which will be used with most of the children in the instructional group. There has been too little spontaneous creative writing from the children, so they will try some "stimulator" activities. The two hundred children will be grouped into teams for writing poems, stories, plays, radio dramas, and a newspaper. The instructional team will act as consultants. The work of each student team will be used to stimulate others.

Marge and Maureen, with a small group of children, are making a video tape for the arithmetic program. The other members of the direct-instruction team have children in the self-instruction center working on arithmetic and in the independent inquiry center for project-type activities in the social studies. Four children have gone with Tommy to the human relations center for a weekly session with one of the counselors.

12:00 noon: Harvey Thompson and Marge Wilson have lunch with a different group of children each day so that every other week each child has a one-hour period as a member of an intimate and informal group with one of the two team leaders. Mary Mercer is with Harvey's group today because these children have recently transferred to the team from another school district. Mary's job is to make them feel welcome, to get to know them, and to transmit any important personal information to Harvey and Marge. At lunch she helps them to feel comfortable and, by asking questions, sees that Harvey learns something about them. One of the children was in the group which operated the simulated store that morning, and Harvey persuades her to describe to the others what she did and how she felt about it. This provides him with a child's-eye view of the simulation, and he notes that she has not yet connected it with the rest of the social studies program. After only one experience with the store it is natural that gadgets and learning to operate them

will fill her mind, but he must be careful to keep track of that aspect of the situation.

1:00 p.m.: Nearly all the children are engaged in small group or individual activities. Many of them are in the self-instruction center, some in the independent inquiry center. Marge and Florence are conducting remedial reading activities. Harvey and Tommy take the morning's science group to the independent inquiry center to hunt for materials for their next set of experiments. When he is satisfied that Tommy can handle the situation, Harvey returns to the team suite and prepares the large group instruction area where a member of the art staff will work during the next hour. He explains to the art consultant that the team has been having difficulty with the Renaissance art unit. The art consultant agrees to make a demonstration tape of his discussion with a small group of children so that the staff can examine it. He calls on another art staff member to observe the discussion to determine whether the problem is with the teachers, because of inadequate knowledge of art, or with the matching of subject matter to the children.

2:00 p.m.: Harvey is listening to the art lecture and preparing for follow-up with his small group. (At the beginning of the unit, they had used video tapes for the large group meetings, but since the children did not respond actively, it was decided to use live speakers for short periods of time, followed by discussions, some of them held by the art consultants.) The art consultant has brought along a suit of armor and some medieval weapons. Many of the boys are enthusiastic. As Harvey observes the children's reactions, he wonders whether it might not be best to concentrate more on the social life of the times, integrating art with the social studies units, rather than treating the art by itself.

In the conference afterward, Harvey and the consultant conclude that the Renaissance art unit is going extremely well with the older, more verbal students but not well at all with the others. With Marge, they decide to continue the program for one or two days to be sure, and then if their feelings are confirmed, to extend the unit for the older children and create a different activity for the others.

3:00 p.m.: For twenty minutes after the children have gone home, half of the team listen to and criticize recordings or video tapes of lessons with the other half of the team. Harvey plays a tape of his morning science discussion and Marge critiques it for him. They both notice that one child has made an awfully high proportion of the contributions to the planning session which closed his discussion. Marge also questions whether the hypotheses the group set up were as well-worded and explicit as they might have been. Harvey feels that the criticism is accurate, and they discuss ways that he can help this group sharpen their thinking.

3:30 p.m.: Marge conducts a meeting with the direct-instruction team about the reading program. She has some suggestions for individual conferences and a report from the self-instruction center about the children's progress on word-attack skills. The team rule is to get the children to teach themselves everything possible, using team time for the things children have difficulty teaching themselves. Most of the reading program takes place in individual conferences during which the children discuss their progress with self-instruction materials for skill development and identify projects and readings for independent inquiry. Small groups are gathered for remedial work and for the children who do not work well by themselves. Mary Mercer's role is with the children who have trouble keeping themselves at individual learning tasks. Her tactics are motherly and supportive while Marge is rather brisk and direct, and they try to plan so that they work with the children for whom their styles are most effective.

4:00 p.m.: All team members are independently preparing for the next day. Harvey is working on the agenda for a morning meeting on the creative writing unit and preparing a math lesson for a group of the older children. Marge finishes up correspondence for the team (they share a secretary with another team), and George is in the computer support center setting up the plans to use the simulated store the next day. Florence is matching self-instruction reading units to children's needs for the next few days. Each day she does this for a certain number of children so that each child's progress is reviewed by her or Marge at least once every two weeks. John, Maureen, and Tommy are in the independent inquiry center developing resource units for social studies groups.

The Team and the Teacher

Harvey Thompson is a teacher with a large and complex staff who can do many kinds of things. He is not simply a master teacher — one who works better with children than others or who knows his subject better. Harvey is a very good teacher of children, but he is also a master at coordinating the work of many other people and in developing curricular patterns that are tailored to the kinds of students he has, the kind of place where they live, the requirements of many subject matters, and the capabilities of a large variety of instructional materials. His immediate staff includes the seven other members of his direct-instruction team, and his extended staff, the people who work in the six support centers. Because his staff can not only interact effectively with children but create and provide instructional resources, Harvey is able to individualize his teaching and utilize effectively the talents of subject specialists

and technologists. The direct-instruction team members make the final decisions in the educational process, so the judgments about what each child will do and what he will learn are made by the people who know him well and are able to shape the environment around him intelligently and creatively.

The payoff for this, of course, is what happens to the child, the kind of education a child experiences with Harvey Thompson, his team, and a supportive staff, who bring all kinds of competencies and materials and content to the world of the child.

Kinds of Learning

Harvey Thompson and his team orchestrate the environment so that the child learns primarily from the three learning situations: (1) personal inquiry, where he pursues an interest of his own; (2) independent study, where he works with materials that are geared to his development, and through the use of these materials, teaches himself skills and knowledge that his teachers think are important to him; (3) group inquiry, where he and his peers develop and inquire into problems that are important to them and appear significant to the teacher.

Personal Inquiry

Thompson and his staff arrange the school setting for children so that they spend a good part of each week pursuing self-selected or small group projects with the help of the team teachers or the independent inquiry center. For example, each child selects books to read for pleasure and consults one of the teachers who helps him find things that are meaningful to him. The teachers try to persuade each child to write or record something of personal significance every week — a poem, a play, an essay. The child pursues topics that interest him. One month he may study snails; another time he may read the poems of Robert Frost or study the history of baseball.

To shape the personal inquiry phase of his education, a child meets several times each week with one teacher to discuss his reading and writing program. The teacher helps him to get to the resources he needs to carry out his investigations — a telescope, a book on India, clay for a sculpture.

The direct-instruction team tries to be sure that each child has a well-developed personal inquiry program. They try to build a social climate which encourages and supports inquiry of many kinds in many areas of life. The teacher, of course, has opinions about what might be productive for each child's personal inquiry, but his role is not to impose his opinion. His role is to aid the child as an academic counselor, to help shape gently and

gradually the child's interests in such a way that they will extend his uniqueness rather than impose the stamp of the teacher on him.

Independent Study

The child's independent study is at his own pace but toward goals he has in common with other children in the group. For example, each child needs to learn word-attack skills in reading and in spelling and the conventions of the standard grammar of his time. In the self-instruction center there are many programs and materials that each child can use independently as he works toward common goals at his own pace. He may learn spelling through programmed instruction, arithmetic with the help of a teacher through a basal text, phonics skills in a language laboratory. His progress will be monitored through tests which are imbedded in the instructional materials and scored by computers many miles from the school. The scores are interpreted by the teachers who have direct contact with him and who adjust his independent study program to his progress and learning style. Because some children have difficulty teaching themselves, the teachers stand ready to help them directly. For example, Marge Wilson met with several small groups in reading. Some of these groups have difficulty learning to read by any means. Others are readers of considerable capacity but find it difficult to learn through programmed or other self-instruction materials. One of Harvey Thompson's abilities is the diagnosis of learning style and the *arrangement of environment* so that the independent study programs are matched to the learner.

Each instruction team, however, tries to promote a climate in which each child will take responsibility for his own learning. If a child has difficulty, the knowledge of that difficulty is shared with him and he is helped to develop an independent study program designed to meet his problem.

Group Inquiry

There are many things a person can teach himself if he has a guide and a friend and the assistance of good books and other study materials. But there are some things that are not learned best alone. It is no fun to debate the outcome of an election with yourself. Setting up hypotheses for an experiment is often better when they must stand up against competition. Putting on a play is not very often a solitary endeavor. The discussion of important ideas is necessary if your own understanding is to be improved. So, part of each child's day is spent working with a reasonably small group, usually from five to ten. These inquiry groups are formed at the beginning of

the school year and changed as the year goes on. Their task is to determine things of common interest. Teachers make many suggestions. For example, each year each group inquires into something political because such inquiry is essential to the education of each child. Some of the inquiries take only a few days; some take weeks or months.

The child also studies as a member of a large group — through lectures, simulations, films. The purpose of such large group study is to stimulate small group inquiry, as in the case of the unit on the Renaissance that does not seem to be going well. The direct-instruction team avoids large group study for its own sake. If possible, a lecture is video-taped so that small groups or individuals can observe it. Similarly with demonstrations. Resource visitors are brought in for open questioning rather than for giving information. If there is to be an information-giving session, the direct-instruction team tries to get the visitor to tape-record or video-tape it.

Each child does not engage in the same amount of personal inquiry, individual study, and group inquiry. Some individuals have such well-developed personal inquiry skills and individual study programs that the group part of their education is rather small. The opposite is true for others. However, the direct-instruction team tries to keep some balance in the life of each learner among all three types of learning situations. Even a child who now has difficulty with personal inquiry may learn a great deal later if he has sufficient exposure and counseling. Every child can be taught to learn some things through individual study. And even though some individuals have great difficulty with group inquiry, they are always attached to one inquiry group in at least one subject area. The fact that they have difficulty with group inquiry does not mean that they should be withdrawn from it entirely. It may mean that they need special instruction in handling themselves as members of a group.

The child, then, lives a balanced life as a learner. For *personal inquiry* he studies things that he selects and that are important to him, but with assistance from his teachers. In *independent study* he studies things that he understands will help him to develop in skill and in intellect. In *group inquiry* he works with his peers, thrashing out what is significant to learn and how to learn it.

Harvey Thompson does not work alone. He has human assistance and he has the best technological aids the age can provide. In addition, he is in a position to control technology — he is not controlled by it. And because his support centers have the capacity to create materials, Harvey Thompson is able to tailor the educational program to the needs of the child, the conditions in the community, and the nature of the academic disciplines.

Postscript

It seems important to refer again to the purpose of this essay, which is to add to the dialogue about school organization by suggesting some ways that teachers and technology can be brought together to create a myriad of personalized, creative educational programs. To this end, a structure was suggested in which the curricular decision-making task was invested in a highly competent teacher with a specialized staff and technological support centers that could respond to his requirements.

The purpose is *not* to spread the idea that direct-instruction teams combined with support centers is *the* desirable pattern for American public schools; there are countless desirable patterns. And the challenge is not to spread ideas about the use of teaching teams or programmed instruction or the use of paraprofessionals or any other old idea. It is to develop creative mixes of teachers, resources, and children.

For too many years uniformity of structure has characterized the American school. The self-contained elementary school teacher and the departmentalized secondary school teacher have served all functions for too many children. These teachers have been backed up by inadequate libraries and only those textbooks that publishers feel are commercially attractive and politically safe. *Now those patterns are breaking down.*

In the future there will be not just one organizational pattern nationwide; there will be many. Tomorrow will bring not one national curriculum; it will bring as many curriculums as there are curious children and exciting teachers.

Teachers and children will select together from what Ole Sand calls the "pharmacies of tested educational alternatives," and will thus create the diverse education for the creative and varied Americans of the future.

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Bruce R. Joyce

Bruce R. Joyce is almost incredible. If we did not know him personally, we would be sure that he was the mythical creation of a great artist who, distraught with all the ordinariness of human beings, wanted to stun people with a real Auntie Mame, seasoned with a large measure of Mary Poppins and a generous pinch of the Man of LaMancha, who dreamed impossible dreams. Fortunately for us, Joyce is no myth. He is very much alive.

His curiosity about and enthusiasm for education on all cultural, economic, philosophical, and age levels is astounding, and his writings, filled with deep insights, jump out at you with a sudden, startling, refreshing New Yorkerish twist. It is never easy to put down a Joyce manuscript.

Dr. Joyce has been an elementary school teacher, has taught at Wayne State University, the University of Delaware, the University of Pittsburgh, the University of Chicago, Manhattanville College of the Sacred Heart, and is presently an associate professor of education at Teachers College, Columbia University.

In addition to several regular consultant positions, Dr. Joyce has had time to lecture widely, write numerous articles for educational journals, develop five research instruments, and publish nine pamphlets. Among his books are *Strategies for Elementary Social Science Education, The Structure of Teaching,* and *Alternative Models for Elementary Education.* He has been known to eat and sleep on occasion.

Joyce received his bachelor's degree, with a philosophy major, from Brown University, his master's in education from the University of Delaware, and his doctorate in curriculum and instruction from Wayne State University.

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